

AB 1318: Assessment of Electrical System Reliability Needs in the South Coast Air Basin and Recommendations for Meeting Those Needs

**CEC 2011 IEPR / ARB AB 1318
Joint Workshop on
Offset Challenges for Fossil Power
Plants in Southern CA**

South Coast Air Quality Management District
Diamond Bar, California
February 15, 2011

Presentation Overview

- Legislative directive
- Activities to date
- Framework for electric reliability needs assessment
- Plan to address offset availability issues for fossil generation identified in needs assessment
- Public participation process
- Proposed schedule
- Next steps

Assembly Bill 1318

- Requires ARB, in consultation with CEC, CPUC, CAISO, and SWRCB to prepare a report for the Governor and Legislature that evaluates the electrical system reliability needs of the South Coast Air Basin (SCAB) and recommends the most effective and efficient means of meeting those reliability needs while ensuring compliance with State and federal law
- If it is determined that additional fossil generation is needed, given current air permitting issues facing power plants under the SCAQMD program, the report is to include recommendations for long-term emission offset availability and options to ensure sustainable permitting of additional needed capacity

Activities to Date

- ARB, CEC, CPUC, and CAISO technical staff have developed a Draft Work Plan outlining schedules, responsibilities, and available information to support the evaluation required under AB 1318
- Forming two technical agency teams to manage analysis required to meet the legislation
- Agency consensus that studies already completed or underway do not have sufficient information on various load and resource scenarios to provide complete reliability assessment
- More detailed studies needed to provide analysis extending to 2020
- November 10th project kick-off meeting in SCAQMD

Electric Reliability Needs Assessment

Long-Term Objectives

- Determine the amount of fossil capacity that must be located in the SCAB to satisfy national, regional, and local (CAISO and LADWP) reliability standards that:
 - Support load growth
 - Enable OTC retirement/repowering
 - Enable renewable integration
- Examine future generation requirements in sufficient detail to determine a credible range of offsets that may be required for new fossil generation annually out to 2020
- Consider options to address the need for air offsets, including load reductions, improved transmission, repowering, etc.

Background

- CAISO operates most of the transmission grid in California
- CEC permits new power plants, conducts planning assessments and develops a biennial policy report
- CPUC regulates SCE rates, service and reliability
- FERC regulates the ISO and Southern California Edison transmission rates, service and reliability
- LADWP operates its own transmission system and is independent of the CPUC
- Both LADWP and CAISO have to satisfy NERC and WECC reliability standards
- SCAQMD's permitting rules influence new power plant development and repowering in SCAB (all of LADWP and a portion of CAISO)

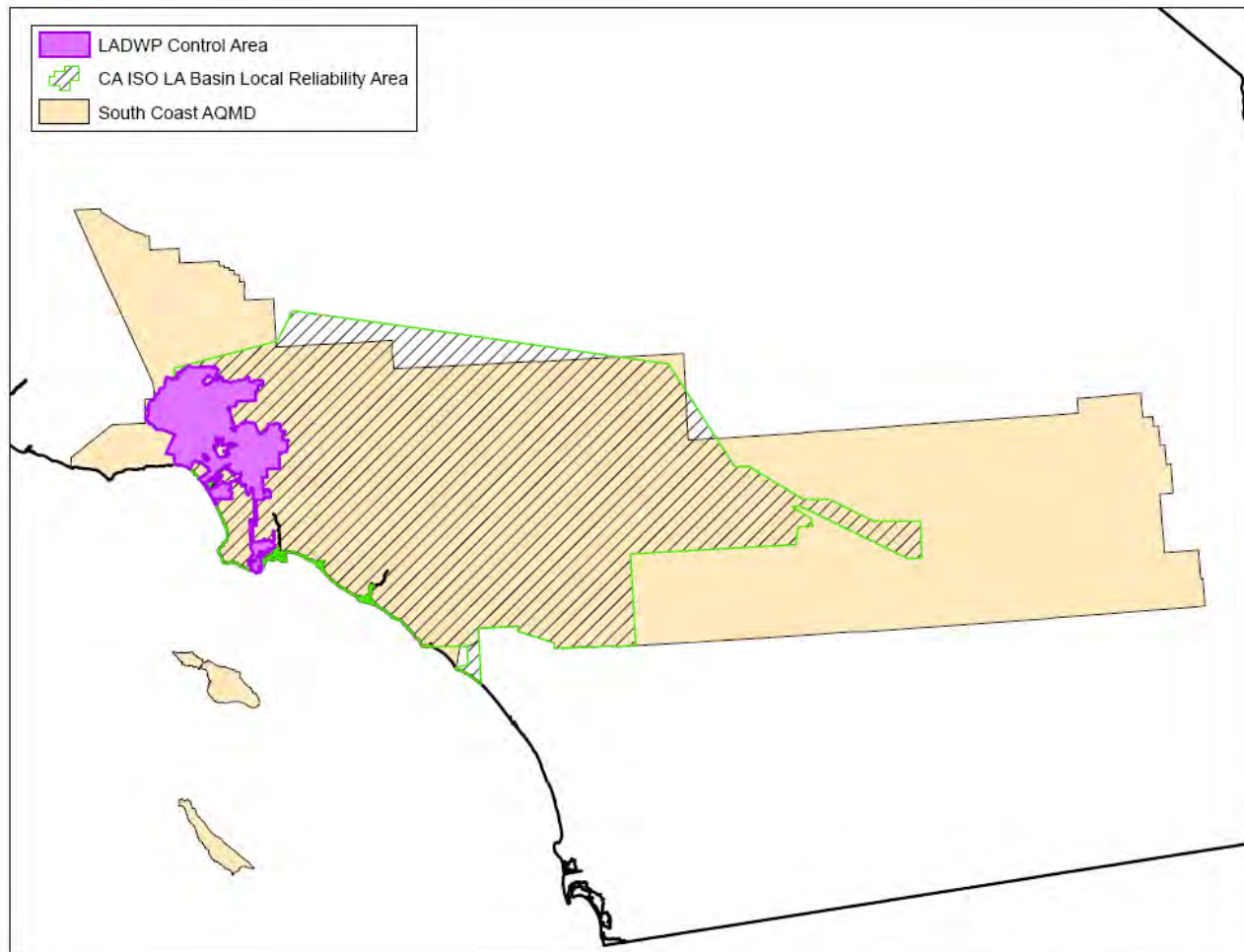
Analytic Challenges

- It is more challenging to perform reliability assessments for the SCAB geographic region due to the need to coordinate studies between two Balancing Authority Areas
- Major changes in electricity industry (OTC mitigation, renewable development goals, GHG emission limits) are increasing uncertainty and complicating planning
- Resources needed for evaluation of AB 1318 issues are also needed for many other important planning and policy forums
- Strong need for inter-agency coordination to ensure that study results are useful and meet objectives

Compliance Schedule for OTC Plants in the State Water Board Adopted Policy

Power Plant	Responsible Party	Due Date
Humboldt Bay	PG&E	12/31/2010
Potrero	GenOn Energy, Inc. (merger of RRI and Mirant)	One year after the effective date of policy (10/1/2011)
South Bay	Dynegy	12/31/2011
El Segundo, Harbor (LADWP), Morro Bay	NRG Energy, LADWP, Dynegy	12/31/2015
Encina, Contra Costa, Pittsburg, Moss Landing	NRG Energy, GenOn Energy, GenOn Energy, Dynegy	12/31/2017
Haynes (LADWP)	LADWP	12/31/2019
Huntington Beach, Redondo, Alamitos, Mandalay, Ormond Beach, Scattergood (LADWP)	AES, AES, AES, GenOn Energy, GenOn Energy, LADWP	12/31/2020
San Onofre Nuclear Generating Station	SCE	12/31/2022
Diablo Canyon Power Plant	PG&E	12/31/2024

Jurisdictional Issues for Analyses of the SCAB Geographic Area



Factors Affecting Development of Amount & Location of Power Plant Capacity

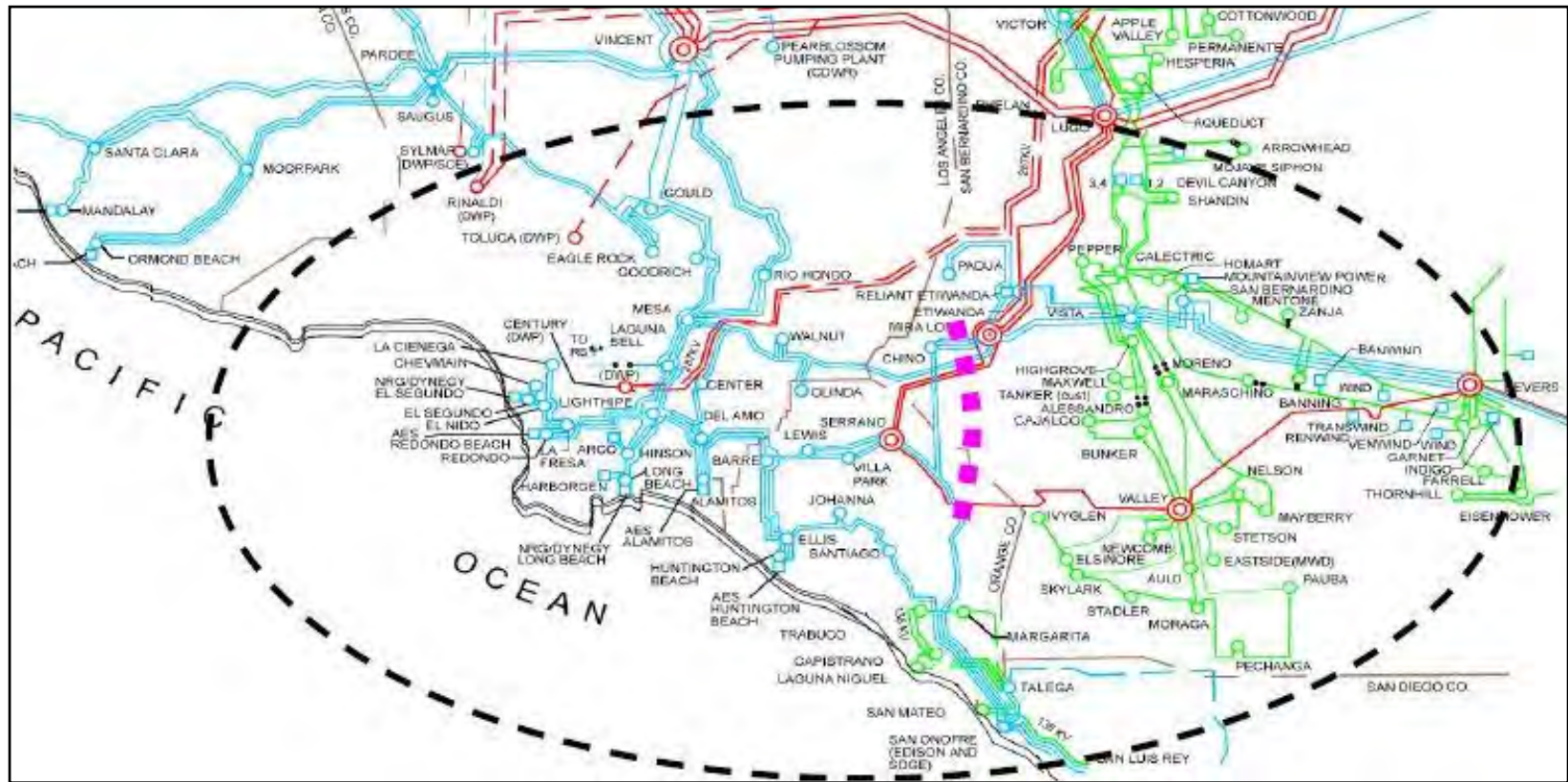
Increasing Capacity Needs

- Retirement, retrofit or repowering of existing OTC capacity
- Retirements of other aging capacity
- Economic development (or other factors) causing electric load growth (i.e., electric vehicles)
- Ramping capacity needed for renewable integration

Decreasing Capacity Needs

- Reliance upon feasible and proven energy efficiency, demand response or customer self-generation programs to reduce grid-supplied electricity and services
- Mix of renewable generation reducing capacity for integration
- Transmission expansion
- Distributed generation

LCR Relationships Can Change as the Transmission System Evolves



Reliability Analyses

- Develop an understanding of how to conduct the assessment
- Evaluate studies that have been completed, underway, or committed to
- Determine key uncertainties and identify alternative scenarios to evaluate them
- Develop study descriptions of new incremental studies needed
- Conduct reliability studies consistent with level of detail needed for AB 1318 report to legislature
- Estimate a range of emissions from capacity additions for various load and resource scenarios
- Handoff to offset assessment team

Framework for Assessments

- Model out to 2020
- Conduct reliability studies using appropriate regions, not limited to SCAB
 - CAISO (local capacity areas and SP26)
 - LADWP BAA (in basin only)
 - Southern California (ISO, LADWP, IID BAAs)
- Evaluate scenarios that are representative of the range of new capacity needs
 - Load reduction measures
 - Renewable development
- Model with necessary details (screening load & resource analysis spreadsheets, power flow and stability models, etc.)
- Future studies under consideration
 - Operating profiles for annual energy
 - Potential criteria pollutant emissions

Types of Assessments

- Local capacity area requirements:
 - Capacity within a constrained area that needs to be available to respond when 1:10 peak loads occur, with transmission imports at the maximum, under various contingencies
- Regional requirements:
 - Resource adequacy at the zonal or system level
 - Capacity in a region that needs to be online and synchronized to address broad regional concerns, e.g. voltage and transient stability consequences of outages
- Renewable Integration:
 - Highly flexible resources that provide regulation or intra-hour ramping to complement intermittent renewable production patterns

Brief Overview of Existing Available Reliability Studies

- The following existing studies address capacity needs for the areas geographically related to SCAB:
 - ISO 2011 Local Capacity Technical Analysis
 - This study (April 2010) provides minimum generation capacity requirements for the Local Capacity Areas, including L.A. Basin, for the year 2011 to meet applicable NERC, WECC and ISO reliability standards
 - Posted on the ISO web site (<http://www.caiso.com/2788/2788ab565da00.pdf>)
 - Typically, the study results provide the basis for ISO backstop procurement using Reliability Must Run (RMR) and other authorized mechanisms
 - ISO 2012 – 2014 Local Capacity Technical Analysis
 - These studies, released annually in December, provide estimates of capacity requirements for each of the ISO's ten Local Capacity Areas for the next 3 – 5 years time frame
 - Intended to be used for informational purposes only and is not used for RMR procurement
 - Posted on ISO web site (<http://www.caiso.com/287c/287ca3cc28a80.pdf>)

Brief Overview of Existing Available Reliability Studies (cont'd)

- Other existing studies:
 - 2008 study presentation “Impacts on Electric System Reliability from Restrictions on Once-Through Cooling in California”
 - This preliminary assessment provided potential worst case scenario in which all OTC plants were to retire
 - Provided reliability assessments for Northern as well as Southern California electric systems under ISO Balancing Authority
 - Posted on ISO web site
(<http://www.caiso.com/208b/208b8ac831b00.pdf>)
 - The CEC 2009 IEPR (Chapter 3) included an assessment of two OTC retirement scenarios, and concluded that a delayed retirement scenario presented no near term reliability threats
 - http://www.energy.ca.gov/2009_energypolicy/index.html

Brief Overview of Existing Available Reliability Studies (cont'd)

- LADWP recently completed an integrated resource planning process
- LADWP transmission and resource plans can be found at the following webpages:
 - http://www.lapowerplan.org/documents/final_draft/IRP_Final_Draft.pdf
 - http://www.lapowerplan.org/documents/final_draft/IRP_Final_Draft_Appendix_F.pdf
 - http://www.lapowerplan.org/documents/final_draft/IRP_Final_Draft_Appendix_I.pdf

Relevance of Existing Studies

- The existing studies are inadequate to answer the expectations of AB 1318
- Concerns supporting this conclusion:
 - Time horizon is too short
 - No evaluation of demand-side policy options
 - No evaluation of possible capacity value of renewable generation development
 - No comprehensive assessment of transmission options
 - Potential cumulative and aggregated impacts on transmission reliability due to OTC generators' actions to comply with the State Water Board Policy not fully assessed
 - No examination of emission implications

Further Studies Required

- Reliability assessment of ISO 2020 “hybrid” renewable scenario
 - Currently planned for first quarter 2011
 - ISO “hybrid” scenario to satisfy 33% renewables by 2020
 - Included moderate amount of out-of-state renewable and internal distributed generation resources to the ISO “high utilization portfolio”
 - Included more renewable generation from IID
 - More information on the assumptions for the amount of capacity and energy is available on the ISO presentation at (<http://www.caiso.com/286b/286bf0d441a20.pdf>)
 - Evaluate Local Capacity Requirements (LCR) for L.A. Basin within ISO BAA
 - Review and re-examine evaluation of zonal area (SP26) reliability impacts within ISO BAA
 - This study was performed as part of ISO 33% RPS transmission evaluation within the ISO 2010/2011 transmission planning process

Further Studies (cont'd)

The following analyses are also planned to be performed in the first quarter of 2011:

- Assess scenarios with Version 2 of the load and resource scenario analysis tool (Tool) posted on ISO website (<http://www.caiso.com/1c58/1c58e7a3257a0.html>):
 - Renewable resource scenarios
 - 4 CPUC renewable scenarios (trajectory, environmentally constrained, cost constrained, fastest timeline)
 - 1 ISO renewable scenario (the ISO “hybrid” scenario is used for evaluation for this scenario)
 - Load scenarios
 - Incremental load modifiers for EE, DR and CHP based on CCEF goals
 - Impacts are beyond those in CEC-approved demand forecasts
 - Load modifier assumptions lead to high, median and low net loads that can be used in transmission assessments
- Extend Tool to the entire area under Southern California Air Basin (SCAB) jurisdiction (i.e., areas under either ISO and LADWP)
 - Utilize “OTC Load and Resource Scenario Analysis Tool” to evaluate various future load and resource scenarios
 - Determine critical years and scenarios which may require further detailed technical evaluation

Overview of CCEF Goals as Modeled in the OTC L&R Analysis Tool

Renewables Scenario (all meet 2020 goal)	Low Net Load	Mid Net Load	High Net Load
1) <i>Trajectory</i> : emphasis on current trajectory of utility contracting 2) <i>Environmentally-constrained</i> : emphasis on resources with the least assumed high-level environmental concern 3) <i>Cost-constrained</i> : emphasis on least-cost resources 4) <i>Time-constrained</i> : emphasis on resources that can come online quickest	EE 18,000 GWh EE 6,102MW CHP 3,391 MW CSI 393 MW DR 5,355 MW	EE 11,868 GWh EE 5,687 MW CHP 1,638MW CSI 0 MW DR 5,100 MW	EE 0 GWh EE 0 MW CHP 0 MW CSI 0 MW DR 2,581 MW
5) <i>ISO Hybrid scenario</i> : mixture of in-state, out of state and distributed generation for 2020 only <ul style="list-style-type: none"> a. <i>In-state total (15,838 MW)</i> b. <i>Out-of-State (3,842 MW)</i> c. <i>Distributed generation (2,902 MW)</i> 			EE 0 GWh EE 0 MW CHP 0 MW Distributed Generation (2,902 MW) DR 0 MW

Additional Studies

- Upon receiving generation owners' implementation plans submitted to SWRCB (April 1, 2011), the following analyses are planned to be performed:
 - Update OTC Load & Resource Analysis Tool to reflect generator owners' implementation plans and/or other information for both ISO and LADWP BAAs;
 - Perform analyses using the above updated Tool;
 - Update ISO LCR analyses of L.A. Basin for 2020 “hybrid” renewable scenario case, incorporating the generator owners' implementation plans and/or other information for OTC plants in the L.A. Basin

Additional Future Studies (cont'd)

- The following studies are planned to be performed after receiving adequate modeling data:
 - Technical assessment (i.e., power flow and stability studies) of the CPUC renewable scenarios and CEC load modifiers
 - Identifying potential range of capacity additions across various load and resource scenarios
 - Assessment of adverse and optimistic operating profiles (from emission perspective) of new capacity requirements in the SCAB area;
 - Assessment of a range of emission offsets consistent with a new generating capacity additions

Summary of Approach

- Develop estimates of a range of generation additions, as a result of alternative future scenarios, that must be built through 2020 to serve load, allow OTC mitigation, integrate renewables, while satisfying reliability standards
- Develop a range of estimates of emission factors, based on the alternative operating patterns of new generation
- Use a range of emission factors based on technology of needed new thermal generation to translate range of new capacity into a range of new emissions for different load and resource scenarios
- Provide a foundation for examining what options exist to increase offset availability for power plants to allow necessary development

Offset Availability Assessment

Plan for Evaluating Offset Availability

- Outcome of electric reliability assessment will dictate overall scope and breadth of options needed to permit identified MWs of fossil generation
- Revisit concepts identified by SCAQMD's NSR Working Group in 2009 as starting point
- Solicit additional concepts from stakeholders through public workshop or working group process

Plan for Evaluating Offset Availability (cont'd)

- Evaluate each concept for legal, environmental, administrative, and timing issues and quantify offsets available
 - Include consideration of communities already highly impacted by air pollution
- Rank options based on impacts to air quality, timing, and other criteria
- Reconcile capacity identified through electric reliability assessment with amount of offsets available via new offset availability concepts
- Participate in post-project efforts with SCAQMD and others to implement new recommendations in offset availability for permitting power plants

Potential Concepts to Increase Offset Availability

- District-level actions
 - Modify SCAQMD policies and practices. For example:
 - Evaluate additional mechanisms to increase credit generation opportunities – identify non-traditional sources of ERCs
 - Modify SCAQMD rules to increase permitting flexibility. For example:
 - BARCT vs. BACT discount for newly generated ERCs
- Federal-level actions
 - Work with U.S. EPA on potential federal reforms
 - Develop a separate program for power plants (e.g., essential public service)

Potential Concepts to Increase Offset Availability (cont'd)

- State-level actions
 - Allow flexibility for offsets under SB 288 while maintaining air quality protections
- State-level concerns
 - Any concept that requires amendment to SCAQMD's NSR rules triggers Senate Bill 288 (SB 288) evaluation by ARB

Senate Bill 288

- “Protect California Air Act of 2003”
- Concern that federal “reforms” would undermine California’s NSR programs and degrade air quality
- Generally prohibits districts from weakening NSR rules compared to rules that existed on December 30, 2002
- Prohibits specific NSR rule changes that would reduce the obligations of a source (e.g., BACT, definition of modification, calculation methods, thresholds)

ARB SB 288 Guidance

- SB 288 generally does not allow relaxation of stringency of NSR rules
- For listed elements, rule can be no less stringent on a source basis
- For elements not specifically listed (e.g., offsets), rule can be no less stringent on a programmatic basis – does not relieve district from finding equivalent reductions if offset obligation is reduced for a specific project

Public Participation Process

- Plan to provide multiple opportunities for public review and comment through public workshops and/or smaller, issue-focused workgroup sessions
- Available to meet with stakeholders on an individual basis
- Project webpage and list serve:
<http://www.arb.ca.gov/energy/esr-sc/esr-sc.htm>
- Draft of final report will be available for public comment prior to finalization

Next Steps

- Review and integrate input received on Draft Work Plan
- Initiate/complete studies identified in Draft Work Plan for determining conventional generation needs out to 2020
- If reliability assessment points to need for additional fossil generation, develop, analyze, and prioritize options for increasing offset availability
- Initiate full public process for all elements of AB 1318 including public meetings/workshops

Open Discussion